tion of the latitude variations. The present tests of the new photographic instrument were undertaken with a view to the employment of such instruments at the four proposed stations. The results obtained at Potsdam will, therefore, cause the adoption of the older form of instrument.

PROF. ALBRECHT has published his 1896 report on the variation of latitude. He has included all series of observations from 1890.0 to 1896.5 and, after plotting them, has drawn a curve through the points obtained. This furnishes the means of getting the instantaneous latitude for any place on the earth, and for any time between the extreme dates used in the formation of the curve. This is probably the best way of treating the question, so far as the reduction of recent meridian observations is concerned, but it is useless for purposes of prediction, or for the re-reduction of older series of observations. But perhaps the time has not yet come for a definitive attempt to obtain laws for the motion of the pole which will permit accurate prediction, or which will represent former motions of the pole with entirely satisfactory precision. H. J.

SCIENTIFIC NOTES AND NEWS.

GEOLOGICAL FIELD WORK OF THE UNIVERSITY OF WYOMING.

PROF. WILBUR C. KNIGHT, of the Geological Department of the University of Wyoming, writes that the field work carried on by the department has just closed for the year. The entire season has been spent in studying the Jurassic terrane and collecting its fossils. Besides securing valuable stratigraphical data, many fossils new to science have been discovered. The collection is so large that it will take a year to arrange it for study. The new material can be roughly classified as follows: Invertebrates, six species. Pisces, two species of *Ceratodus*. Plesiosaurs, two species. Ichthyosaurs, one vertebra of a large animal. This must not be confounded with Marsh's *Baptanodon*. Dinosaurs, four species—two carniverous and two herbiverous. Crocodiles, one species.

With this year's discoveries it is now definitely known that there are three species of American Jurassic plesiosaurs, and it is very probable that there are four. This institution has the largest collection of these animals known.

The dinosaurs are very interesting. The largest carnivor is, so far as can be determined at present, a Megalosaur, but not allied to Marsh's *Ceratosaur*. The second carnivor is a very small animal. The two herbiverous animals have not been unpacked. One of them is a very large animal, and the other of medium size. The crocodile is a small species. All of this material has been taken from beds in new localities that have never received any attention.

While collecting new material, parts of most of the saurians that Marsh has described from the Jurassic were found. One of these is probably his Atlantosaurus. The femur in its natural bed measured 6 feet and 3 inches, and a caracoid measured 18×26 inches. Owing to the great additions made this year, the University of Wyoming now claims the second largest collection of American Jurassic vertebrates in the world, Yale having the largest. As soon as this material can be restored it will be described, after which it will be arranged for the students of vertebrate paleontology.

THE BRAIN WEIGHT OF MAMMALS.

AMONG the numerous valuable memoirs in the Gegenbauer *Festschrift* is one by Max Weber, professor of zoology in Amsterdam, entitled 'Preliminary Studies upon the Brain Weight of Mammals.' This contains the most exhaustive and accurate statistics which have been collected hitherto upon the absolute weights of the brain in the mammals and upon the relation of brain weights to body weights. In every case the sex is indicated, also the general condition of the animal. The length of the animal is given, the weight of the body, the weight of the brain, the ratio and the percentage of brain weight to body weight. The conclusions which Prof. Weber draws are thus based upon the most extensive and accurate statistics which have ever been brought together. They are as follows: First, in the matter of absolute brain weight

man is surpassed only by the Proboscidia and Cetacea; with this exception the human brain surpasses that of any other mammal. Second, the relative brain weight of the average European is only surpassed by that of certain smaller animals in which the relative weight is exceptionally high. Third, as to the relation of brain weight to body weight in the comparison of the smaller and larger mammals, it is evident that the brain weight does not increase in proportion to the body weight. Fourth, as a general rule, within any natural order of mammals, the relative brain weight decreases with the increase of the body weight; in other words, within any natural order the smaller mammals have relatively larger brains. But this rule is not without exceptions. In growing individuals the relative brain weight falls off until the maximum of growth is reached. Since the growth of the brain is reached earlier than the growth of the body, this decline is not by any means uniform in different cases. Among the animals which surpass man in the ratio of brain weight to body weight are the following: Among the Rodentia, *Sciurus* and *Mus*, and among the Primates many Old and New World monkeys.

GENERAL.

Benjamin Apthorp Gould, the eminent astronomer, died on the evening of November 26th, at his home in Cambridge. His death was due to the effects of a fall that happened two hours previously. He was born at Boston on September 27, 1824. We hope to give an adequate account of Gould's life and contributions to astronomy.

Plans have been filed for the Botanical Museum to be erected for the New York Botanical Garden in Bronx Park. The building will be of brick and terra cotta, with a frontage of 308 feet. The cost of construction is estimated at $250.000.

At the recent meeting of the *Deutsche Naturforscher und Aertze* arrangements were made for a society of pathological anatomy and physiology.

The Governors of St. George's Hospital, London, of which Jenner was a pupil, propose to inaugurate a national memorial to celebrate the discovery of vaccination. Sir Joseph Lister will preside at a meeting on December 7th, at which the best means of carrying out the project will be discussed.

A committee has been formed in London with a view to publicly recognizing the completion of Mr. Herbert Spencer's *Synthetic Philosophy*. It has been proposed to place a statue in the Museum of Natural History, South Kensington, or a portrait in the national portrait gallery, but it is understood that Mr. Spencer himself does not approve of the plan.

M. Berthelot has collected, under the title *Sciences et Morales*, a number of his articles and addresses treating of the relation of science to society and education. Among these may be mentioned the address before the French Senate on higher education biographical notices of Pasteur, Cl. Bernard and P. Bert, and several articles on the history of the sciences, such as the discovery of alcohol, the survival of ancient industries, the chemistry of the Arabs, pearls, and Papin and the discovery of the steam engine.

We have already announced that the New Research Laboratory of the Royal College of Physicians, Edinburgh, was formally opened on November 6th. Dr. Batty Tuke, in declaring the laboratory open, stated that it was the best equipped in Great Britain. It contains well-equipped laboratories for chemistry, histology and bacteriology, a large experimental room supplied with physiological apparatus, and a photographic room. The laboratory is open to those who are competent to undertake investigation in the medical sciences, and chemicals, etc., are supplied free of charge.

Prof. Windham Dunstan, the new director of the scientific and technical department of the Imperial Institute, London, gave a lecture on November 9th, describing the arrangements and work of the department. It occupies large laboratories, which have been well equipped by the Goldsmiths' Company. The Royal Commissioners of the 1851 Exhibition have provided funds for the payment of the staff, and a research fellowship has been endowed by the Salters' Company. The department proposes especially to investigate the natural products of India and the colonies and to assist in the

utilization of these. It is prepared to answer questions and furnish information on this subject. Investigations are already in progress on the comparative value of Indian coal deposits and iron ores, of Indian and colonial timbers, fibres, dye-stuffs and tanning materials, and especial attention will be given to the study of medicinal plants. The department is intended to become an imperial bureau of scientific and technical investigation and advice.

WE regret to announce the deaths of Dr. Karl Cornelius, docent in physics and meteorology in the University of Halle, and of Dr. Hanot, the French physician, well known for his numerous and important researches in pathology.

A LETTER from Mr. S. A. Thompsom, at Santa Catalin, Venezuela, published in the daily papers, states that in the course of explorations for the Orinoco Company he, with Mr. Leslie O. Dart, discovered in the Imataca Mountains a waterfall that must rank as one of the greatest in the world. A large river falls over an almost perpendicular cliff from a height estimated at 1,600 feet, not, however, in one body, but breaking into many separate streams.

THE American Economic Association will hold its annual meeting in Baltimore from September 28th to 30th. The President, Prof. H. C. Adams, will give an address on the relation of jurisprudence to economics. The organization of the census for 1900 will be especially discussed.

AMONG industrial expositions announced for 1897 is one at Stockholm, at which special attention will be given to machinery and applied science. There will also be expositions at Brussels and Kief, and an electrical and engineering exposition will be held at Newcastle-on-Tyne.

Nature states that it has received a circular announcing the formation of a British Mycological Society, having for its objects the study of mycology in all its branches, systematic, morphological and pathological, the publication of annual reports recording all recent discoveries in any branch of mycology, and more especially giving a brief synopsis of the work of European mycologists and the recent additions to the British Fungus Flora. An annual week's meeting or foray will be held at some place previously determined at the annual meeting. Mr. George Massee, Royal Herbarium, Kew, has been elected first President, and Mr. Carleton Rea, 34 Foregate street, Worcester, is the Secretary. The first meeting of the Society will be held in Sherwood Forest, commencing on the third Monday in September, 1897.

WE announced recently that Prof. Koch was on his way to South Africa in order to investigate the rinderpest. The *British Medical Journal* calls attention to the fact that an elaborate inquiry into the nature, origin, method of treatment and pathological status of this disease was undertaken in 1868 by a Royal Commission in which Sir Richard Quain, Dr. Burdon Sanderson, Lord Playfair and others took an active part. At that time, however, bacteriological science, which has of recent years made such rapid and important progress, was hardly yet in its infancy, and the present methods of investigation, the perfection of which we owe so largely to Dr. Koch himself, did not exist. Elaborate and careful as was the inquiry, it did little more than prove the intense contagiousness of the malady, and the hopelessness of any available method of treatment except by the pole-axe. The policy of stamping out was urgently recommended, together with a system of liberal compensation. These measures had decisive and successful results within their limits, and the epidemic has not since been able to extend itself within these islands. No subsequent information of a scientific or curative kind has since been obtained, and Dr. Koch's investigation into its possible bacterial origin will be awaited with much interest.

THE *British Medical Journal* states that M. Lemoine, of Rheims, has exhibited before the Biological Society the *clichés* of photographs, obtained by Röntgen's rays, of fossils embedded in the chalk strata of Rheims. The Röntgen rays pass imperfectly through phosphates; the bones of the fossils are clearly indicated in all their details. M. Lemoine has thus photographed a series of birds, reptiles and mammals.

In the number of the Transactions of the Academy of Science of St. Louis (Vol. VII., No. 10) issued on November 10th, Mr. J. B. S. Norton contributes a study of the Kansas Ustilagineæ with special reference to their germination. Mr. Norton gives a list of 33 species found in Kansas. These belong to the genera *Ustilago*, *Tilletia*, *Entyloma*, *Sorosporium*, *Urocystis* and *Doassansia*. Germination studies were made on about half this number by means of hanging drop cultures in water and nutriant solutions. Notes on the distribution of the species in the State and the effect on the host plant are recorded. Two new species are described, *Ustilago filifera* on *Bouteloua racemosa* and *B. oligostachya*, and *Ustilago minor* on *Bouteloua hirsuta*. Five plates illustrate the germination and figure the spores and habit of the new species.

The question of telegony must be decided by experiment, and not by casual observations. In the meanwhile, however, it may not be amiss to reproduce the following alleged cases communicated to the *British Medical Journal* by Mr. E. J. Lowe, F.R.S., and apparently resting on his personal observation. The lasting effects of coition in the male are especially curious. The cases are as follows :

1. A white sow was sired by a black Berkshire boar and produced a litter of black and white pigs ; this sow was next sired by a red Tamworth boar, and although there was no black in either of the parents the progeny were red, black and white, the patches of black being very conspicuous.

2. A black sow and boar (Duckering breed) had always bred their progeny black. The boar then sired a white sow for the first time ; two months later it was sire of the original black sow, which then produced a litter of black and white pigs, although there was no white in either of the parents.

3. An Alderney bull sired a shorthorn cow, the calf being a half-bred Alderney. Afterwards this same cow was sired by a shorthorn bull, but still the calf was partly Alderney.

4. A smooth fox terrier was sired by a rough Scotch terrier, and had rough pups ; it was then sired by a smooth fox terrier, but the pups were many of them rough-coated, and none were like the parents.

5. A Manx tailless tom-cat was sire to an ordinary English cat, and a portion of the kittens had either no tails or very short ones. The tailless tom-cat died some years ago, but up to the present time a few tailless kittens are born.

6. A fair light-haired Englishman married a Brazilian lady, but had no children. Twenty years after he married a light-haired English lady, who subsequently had a dark-haired son that was more a Brazilian in appearance than English.

Among the lectures to be given at the Franklin Institute, Philadelphia, during the present season are the following :

Oct. 30, Dr. Edwin J. Houston, professor of physics, Franklin Institute. 'X-rays.'

Nov. 13, Prof. W. O. Atwater, Wesleyan University, Middletown, Conn. 'Metabolism of Matter and Energy in the Animal Body.'

Nov. 20, Mr. Henry G. Bryant, Philadelphia. 'Characteristics of the most Northern Eskimos.'

Nov. 27, Dr. Joseph W. Richards, Lehigh University, Bethlehem, Pa. 'The Cyanide Process for the Treatment of Gold Ores.'

Dec. 4, Prof. Henry Trimble, Philadelphia College of Pharmacy, Philadelphia. 'Recent Advances in the Study of the Resins.'

Dec. 11, Mr. Francis A. Fitzgerald, with the Carborundum Co., Niagara Falls, N. Y. 'Manufacture and Development of Carborundum at Niagara Falls.'

Dec. 18, Mr. H. M. Chance, mining engineer and geologist, Philadelphia. 'Applications of Electricity in Gold Mining.'

Jan. 4, Lieut. Bradley A. Fiske, U. S. N. 'Electricity in Warfare.'

Jan. 8, Mr. Henry Harrison Suplee, consulting engineer, Philadelphia. 'Locks and Fastenings of Security.'

Jan. 15, Mr. John Carbutt, Philadelphia. 'The Practice of the New Photography.'

Jan. 22, Chas. B. Dudley, Chemist to the Penna. Railroad Co., Altoona, Pa. 'The Ventilation of Passenger Cars on Railroads.'

Jan. 29, Dr. Karl Langenbeck, Supt. of the Mosaic Tile Co., Zanesville, Ohio. 'Chemistry in the Pottery Industry, and some recent Improvements in Imperishable Decorations in Clay Tiling.'

Feb. 5, Dr. Lee K. Frankel, Analytical Chemist, Philadelphia. 'Food Adulteration and the Pure Food Law.'

Feb. 12, Rev. Horace C. Hovey, D. D., Newburyport, Mass. 'The Mammoth Cave and other Magnificent Caverns.'

Feb. 19, Dr. Daniel G. Brinton, Media, Pa. 'The Weights and Measures of Primitive Peoples.'

Feb. 26, Mr. Harold M. Duncan, with the Lauston Monotype Machine Co., Washington, D. C. 'Machine Substitutes for the Composition of Types by Hand.'

March 5, Col. Ira Ayer, Special Agent U. S. Treasury Department, New York. 'The Tin Plate Industry in the United States.'

March 12, Prof. D. S. Jacobus, Stevens Institute of Technology, Hoboken, N. J. 'Artificial Light: Modern Methods Compared—Electric-Incandescent, Welsbach, Acetylene.'

March 19, Prof. W. P. Mason, Rensselaer Polytechnic Institute, Troy, N. Y. 'Sanitary Problems connected with Municipal Water Supplies.'

March 26, Mr. Alfred E. Hunt, President Pittsburg Reduction Co., Pittsburg, Pa. 'The development of the Use of Aluminum in the Arts.'

April 2, Dr. Conrad Berens, Philadelphia. 'Deafness and its Causes.'

April 9, Mr. George F. Kunz, with Tiffany & Co., New York. 'Precious Stones as they have influenced Geography.'

May 14, Prof. John B. DeMotte. Bryn Mawr, Pa. 'The Physical Basis of Mind.'

MR. J. D. WEEKS has just made a report, says the *Railroad Gazette*, on the supply of natural gas and its decline, from which it appears that the supply has fallen to half in seven years. In 1888 the value of the gas produced was $22,629,875. In 1895 it was $13,006,650. In Pennsylvania the fall has been much greater than in Ohio and Indiana. In 1888 the gas produced in Pennsylvania was worth $19,282,375; in 1895 it was $5,852,000. The decrease has been less rapid since 1891, owing to the general introduction of meters, but it has gone on at the rate of about 5 per cent. a year. As the product shrinks rapidly when pressure falls, it may not be over 10 or 15 years before very little gas is produced.

IT is announced that the *Edinburgh Medical Journal*, which is now owned by Mr. Young J. Pentland and is to be edited by Dr. G. A. Gibson, begins a new series with the issue for January, 1897.

THE report of the Manchester Museum for 1895–6 (says *Natural Science*) notes the importance of the recognition of the museum as a public institution by the Manchester City Council, in that a sum of £400 has been apportioned to the museum out of the Free Library Rate. The average Sunday attendance is 519, and may be considered highly satisfactory, seeing that the largest attendance ever recorded on a week day was 1,079. The increase in the collections and library is very marked. The arrangement of the minerals by Mr. Gilbert Rigg, under the supervision of Dr. Burghardt, has been completed as far as the end of the silicates, and it is hoped that a guide to this collection may shortly be published.

UNIVERSITY AND EDUCATIONAL NEWS.

THE tenth annual convention of the Association of Colleges and Preparatory Schools of the Middle States and Maryland was held at the University of Pennsylvania on November 27th and 28th. The subject to which the meeting was especially devoted was the consideration of college entrance requirements. The requirements in history and in science were discussed separately, the latter by Prof. Ira Remsen, Prof. George F. Barker and Mr. O. D. Clark. The conference on college entrance requirements, with special reference to the age at which students now enter college and graduate from the professional schools, was taken part in by a large number of speakers, including Superintendent Edward Brooks, Philadelphia; President Eliot, Harvard University; Vice-Provost Fullerton, University of Pennsylvania; President Gilman, Johns Hopkins University; Commissioner of Education Harris; Chancellor Holland, Western University of Pennsylvania; President McCracken, New York University; President Patton, Princeton University; President Schurman, Cornell University; President Sharpless, Haverford College; President Thomas, Bryn Mawr College; Principal Thurber, Morgan Park Academy, and President Warfield, Lafayette College. On the evening of November 27th Dr. J. C. McKenzie gave the President's address, and brief addresses were made by Superintendent Brooks and President Eliot.

THE Hamilton Court Building Company, composed of friends of Columbia University, have bought for about $200,000, sixteen lots having a frontage of 200 feet on the east side of Amsterdam avenue and a depth of 200 feet on 121st and 122d streets. It is proposed to erect at a cost of $1,000,000 a dormitory that will accommodate about 900 students.